

## EXPLANATION OF THE PLATES.

## PLATE XII.

Upper surface of the smaller cranium of *Pteroplax cornuta*, of the natural size; the portions of ribs mentioned in the text as lying upon and under the cranium are seen. *Fr*, frontal bone; *Pt.Fr*, post-frontal; *Pt.O*, postorbital; *Pa*, parietal; *Sq*, squamous; *Ep*, epiotic; *Q*, quadrate; *Ex.O*, exoccipital; *S.O*, so-called supra-occipital. The parietal foramen and the epiotic horns are sufficiently evident.

## PLATE XIII.

- Fig. 1.* Under surface of the larger cranium of *Pteroplax cornuta*, of the natural size. *Fr*, frontal bone; *Pt.Fr*, postfrontal; *Pt.O*, postorbital; *Sq*, squamous; *Ep*, epiotic; *Q*, quadrate; *Oc*, occipital.  
*Fig. 2.* A, B. Scutes: A upper, B under surface.  
*Fig. 3.* A, B, C. Three digital bones.

XLVIII.—*Characters of new Genera and of some undescribed Species of Phytophagous Beetles.* By JOSEPH S. BALY, F.L.S.

Fam. *Sagridæ*.*Orsodacna variabilis*.

*O. elongata*, convexa, pube subdepressa grisea vestita, subtus cum antennis nigra, thorace rufo, ad latitudinem fere æquilongo, lateribus pone medium constrictis, disco subremote rude punctato; capite elytrisque viridi- aut cærulco-æneis; antennis pedibusque pallide piceis, femoribus obscurioribus.

*Var. A.* capite clytrisque obscure nigro-violaceis, æneo vix micantibus.

*Var. B.* clytris apice fulvis.

*Var. C.* antennis clytrisque obscure fulvis, illis æneo tinctis.

Long. 2-3 lin.

*Hab.* Kurdistan.

Head trigonate; vertex strongly but not closely impressed with large punctures; space between the antennæ transversely excavated; lower portion of clypeus and mouth fulvo-piceous, apex of jaws nigro-piceous; antennæ rather more than half the length of the body, pale piceous, more or less stained with fuscous. Sides of thorax constricted behind the middle, obtusely rounded in front; disk sparingly clothed with coarse suberect hairs, remotely impressed with large, deep punctures. Scutellum semiovate, smooth, impunctate. Elytra broader than the thorax, parallel, convex, depressed along the suture;

clothed with suberect griseous hairs, coarsely and much more closely punctured than the thorax; slightly excavated and irregularly and transversely wrinkled below the basilar space.

The present species differs from *O. mespili* and *humeralis* in its shorter and more coarsely punctured thorax, and in the absence of the smooth longitudinal space on the vertex and front, present in both the other species.

#### Fam. Crioceridæ.

##### *Syneta Adamsi.*

*S. elongata*, griseo-pubescent, sordide fusco-fulva, supra dense punctata, antennis, pedibus elytrorumque margine tenui fulvis, pectore piceo, oculis nigris; thorace crebre punctato, lateribus obtuse angulatis, irregulariter dentatis; elytris rude striatim punctatis, singulatim costis elevatis quatuor instructis, costis prima et secunda minus distinctis, tertia fere obsoleta.

Long.  $2\frac{2}{3}$ —3 lin.

*Hab.* Vladimir Bay, Mantchuria; Tsu Sima, Japan. Collected by Mr. A. Adams.

Head coarsely punctured, lower portion of clypeus smooth, impunctate. Thorax transverse, coarsely punctured; sides obtusely angled, irregularly dentate. Elytra strongly punctate-striate; each with four longitudinal costæ—the second and third only slightly raised and often nearly obsolete, the third only visible towards its apex, the fourth strongly raised.

Nearly allied to *Syneta betulæ*, but differing from that insect in the obtusely angled sides of the thorax.

#### Fam. Cryptocephalidæ.

##### Genus TAPPESIA.

*Corpus* elongatum, modice convexum, pube squamiformi depressa parce vestitum. *Caput* ad oculorum marginem posticum in thoracem insertum, vertice tumido; *oculis* remotis, ovatis, intus vix sinuatis; *antennis* gracilibus, longitudine thoracem paullo superantibus, articulis ultimis quinque vix dilatatis. *Thorax* transversus, lateribus integris; margine postico minute serratulo; lobo basali obtuso, obsolete sinuato. *Scutellum* planum, pentagonum, apice non elevatum. *Elytra* oblonga, lateribus vix lobatis. *Pedes* mediocres, modice robusti; *unguiculis* appendiculatis. *Prosternum* oblongum, planum, margine antico deflexo, margine postico obtuso, angulis posticis obtuse angulatis.

Type *Tappesia Saundersi*.

*Tappesia* may be known from *Elaphodes* by the form of the

prosternum, by the absence of the angular notch at the apex of the basal lobe of the thorax, by the larger and differently shaped scutellum, by the more prominent head, and, lastly, by the elongate form of the body; from *Ochrosopsis* and allied genera it is separated by the differently shaped eyes, by the short antennæ, by the entirely different form of the prosternum, and by the nearly entire basal lobe of the thorax.

*Tappesia Saundersi.*

*T. elongata*, subparallela, modice convexa, subnitida, brunnea, piceo variegata, pube squamiformi adpressa flava et albida parce vestita; antennis pedibusque piceo-fulvis, illarum articulis ultimis quinque apice infuscatis, femoribus piceo tinctis; thorace crebre ruguloso-punctato; elytris crebre punctatis, ad latera et ad apicem obsolete striatim sulcatis.

Long. 2 lin.

*Hab.* Gawler Town, South Australia.

Head piceous, swollen on the vertex, closely rugose-punctate; clypeus transverse, bounded on either side by an oblique ridge, its lower portion, together with the labrum, rufo-piceous: antennæ slender, much less than half the length of the body; five outer joints very slightly dilated. Thorax twice as broad as long at the base; sides rounded at the extreme base, thence obliquely converging and rounded to the apex; basal margin concave and faintly bisinuate on either side, median lobe moderately produced, obtusely angulate, its apex truncate, obsoletely sinuate; upper surface obliquely but slightly depressed on either side behind the middle, closely punctured; interspaces finely rugulose. Scutellum nigro-piceous, scarcely broader than long. Elytra oblong, not broader than the thorax, faintly excavated behind the scutellum, closely punctured; towards the apex and on the outer disk of each elytron are a number of faint longitudinal sulcations, which correspond to the punctate striæ found in most species of *Cryptoccephalidæ*: in the present instance they are not more distinctly punctured than the rest of the surface, but their interspaces are slightly convex.

*Ditropidus Wallacei.*

*D. breviter ovatus*, valde convexus, nitidus, subtus niger, pedibus obscure fulvis, femoribus posticis quatuor piceis; supra metallico-purpureus, labro antennisque fulvis, his extrorsum piceis; thorace minute subremote punctato; elytris sat fortiter punctato-striatis, striis sulcatis, interspatiis lævibus, convexiusculis, iis ad latera convexus.

Long. 1 lin.

*Hab.* Mysol. Collected by Mr. Wallace.

Head impunctate, impressed on the face with a faint longitudinal groove, sparingly clothed with fine adpressed hairs; clypeus obscure piceous, its apical margin concave-emarginate; jaws rufo-piceous; eyes rotundate-ovate, slightly notched; antennæ scarcely longer than the thorax, five lower joints fulvous, the rest piceous. Thorax rather more than twice as broad as long at the base; sides quickly rounded and converging from base to apex; basal margin bisinuate on either side, median lobe moderately produced; above transversely convex, impressed transversely just in front of the basal lobe; minutely and rather distantly punctured; lateral margin dilated at the base. Scutellum broadly ovate, its apex acute. Elytra regularly sulcate-striate, the striæ impressed with linear punctures, interspaces on the inner disk faintly, those on the outer disk strongly convex.

*Ditropidus Jacobyi.*

*D. brevis* ovatus, valde convexus, subtus niger, nitidus, pedibus fulvis, posticis piceo tinctis; supra rufo-flavus, capitis vertice, annis extrorsum thoracisque disco piceis; thorace profunde, minus crebre punctato, punctis oblongis; elytris nigro-piceis, distincte punctato-striatis, striis sulcatis; interspatiis leviter convexiusculis, ad apicem et ad latera convexus.

Long.  $\frac{3}{4}$  lin.

*Hab.* Gawler Town, South Australia.

Head impunctate, sparingly clothed with adpressed hairs; eyes large, reniform, moderately notched, separated above by a narrow space; antennæ equal in length to the head and thorax, slender, five outer joints dilated, pale piceous. Thorax rather more than twice as broad as long; sides quickly rounded and converging from base to apex, anterior angles armed with a minute tooth, hinder angles produced posteriorly, acute; basal margin slightly oblique and faintly bisinuate on either side, the basal lobe rather strongly produced, angulate; upper surface transversely convex, depressed transversely at the base on either side the median lobe; disk impressed, but not very closely, with large deep oblong punctures; extreme apical and basal margins nearly impunctate; the whole of the disk, together with the basal lobe, stained with piceous. Scutellum oblong, its apex obtuse.

*Ditropidus levigatus.*

*D. brevis* ovatus, valde convexus, niger, nitidus, labro, annis (apice excepto), pedibus, pygidio abdominisque apice flavis; thorace

levi, impunctato; elytris nigro-piceis, apicem versus obscure flavis, tenuiter punctato-striatis, punctis linearibus; interspatiis planis, impunctatis.

Long.  $\frac{3}{4}$  lin.

*Hab.* Northern Australia.

Head minutely granulose-punctate, sparingly clothed with very fine adpressed white hairs; face plane; anterior edge of clypeus subangulate-emarginate; eyes distant; six outer joints of antennæ moderately thickened, black. Thorax more than twice as broad as long; sides obliquely converging and slightly rounded from base to apex; basal margin distinctly bisinuate on either side, median lobe moderately produced; upper surface smooth and impunctate. Scutellum ovate, acuminate. Elytra very finely punctate-striate; interspaces plane, impunctate; striæ near the outer margin very faintly sulcate.

#### *Ditropidus Pascoei.*

*D. ovatus*, valde convexus, niger, nitidus, capite thoracque rufo-testaceis, antennis (basi excepta) nigro-piceis, pedibus piceis, anticis quatuor pallidioribus; thorace minute aciculato-punctato; elytris nigro-cyaneis, sat fortiter punctato-striatis; interspatiis planis, duobus externis ad apicem leviter convexiusculis.

Long.  $\frac{5}{8}$  lin.

*Hab.* Melbourne, Australia.

Head glabrous, subremotely punctured; vertex impressed with a longitudinal groove; eyes distant; antennæ less than half the length of the body, five outer joints slightly thickened, nigro-piceous. Thorax rather more than twice as broad as long; sides rounded and converging from base to apex; basal margin bisinuate on either side, the median lobe only moderately produced, obtusely angulate; upper surface subremotely aciculate-punctate, the punctures rather coarser and more crowded on the sides. Scutellum narrowly ovate, its apex acute. Elytra rather strongly punctate-striate; interspaces plane, here and there faintly wrinkled; two outer interspaces obsoletely convex.

#### *Ditropidus elegantulus.*

*D. breviter ovatus*, valde convexus, rufo-fulvus, nitidus, thoracis margine basali antennisque (harum basi excepta) nigris, tarsis piceis; capitis vertice, scutello clytrisque obscure cupreis; his punctato-striatis, punctis linearibus; interspatiis planis, duobus externis subcostatis.

*Mas* mandibulis sat magnis, abrupte curvatis.

Long.  $1\frac{1}{4}$  lin.

*Hab.* Australia.

Head clothed with adpressed white hairs, closely punctured, lower face and clypeus rugose-punctate; front longitudinally concave, obliquely strigose on either side; eyes remote; jaws nigro-piceous; clypeus transverse, its anterior border concave-emarginate, its upper margin subangulate; antennæ nearly half the length of the body, five upper joints dilated, black, second to the sixth stained with piceous. Thorax twice as broad as long; sides rounded and converging from base to apex; basal margin faintly bisinuate on either side, median lobe only moderately produced, obtusely angulate; disk very finely and remotely punctured, the punctures only visible under a deep lens. Scutellum broadly ovate, its apex acute. Elytra distinctly punctate-striate; interspaces plane, two outer ones subcostate. Body beneath stained with piceous.

*Ditropidus pictus.*

*D. breviter subquadrato-ovatus, valde convexus, subtus niger, nitidus, pedibus obscure cyaneo-metallicis, tibiis basi prothoraceque rufo-piceis; supra subnitidus, obscure cyaneus, viridi micans, facie inferiore thoracisque limbo rufo-piceis; antennis rufo-piceis, extrorsum nigris; thorace dense et fortiter aciculato-punctato; elytris distincte punctato-striatis, striis basi impressis, striis quarta et septima apice coeuntibus, punctis piceis; interspatiis leviter transversim rugulosis; obscure fulvis, fascia basali, extrorsum abbreviata, postice irregulariter incisa, suturaque angusta obscure viridi-cyaneis.*

Long.  $1\frac{1}{2}$  lin.

*Hab.* Western Australia.

Head sparingly clothed with adpressed white hairs; closely punctured, longitudinally impressed on the vertex and front; clypeus not distinctly separated from the face, its anterior margin concave-emarginate; eyes widely separated; antennæ with the five outer joints dilated, black. Thorax rather more than twice as broad as long; sides quickly converging and slightly rounded from base to apex; basal margin very slightly bisinuate on either side, median lobe produced, nearly rectangular; upper surface closely covered with coarse aciculate punctures, interspaces on the sides thickened, reticulate-strigose.

*Ditropidus antennarius, Suffr. MS.*

*D. breviter ovatus, valde convexus, rufo-fulvus, nitidus, antennis (basi excepta) nigris; thorace tenuiter, sat remote punctato, margine basali nigro; elytris distincte punctato-striatis, striis tertia et decima, quarta et septima, octavaque et nona apicibus*

per paria coeuntibus; interspatiis planis, remote, tenuissime punctatis, duobus externis leviter convexis; marginibus basali et suturali anguste piceis.

Long.  $1\frac{3}{4}$ -2 lin.

*Hab.* Moreton Bay, Australia.

Head sparingly clothed with short, adpressed, white hairs; vertex and front impressed with a longitudinal groove; the former rather closely punctured; the latter semiovate, concave; lower part of face and clypeus rugose; eyes moderately distant; antennæ rather more than half the length of the body; five outer joints moderately thickened, each nearly twice as long as broad, six upper ones black. Thorax twice as broad as long; sides only slightly converging from the base to the middle, thence rounded and converging to the apex; basal margin bisinuate on either side, median lobe moderately produced, obtusely angulate; upper surface finely and subremotely punctured. Scutellum obovate, its apex acute. Elytra distinctly punctate-striate; interspaces plane, minutely punctured; here and there (when seen under a strong lens) transversely rugulose; two outer interspaces very slightly convex. Body beneath and legs more or less stained with piceous.

*Ditropidus amabilis.*

*D. breviter ovatus*, valde convexus, piceus, nitidus, antennis basi fulvis; pedibus (femoribus posticis exceptis) abdomineque obscure fulvis, hoc piceo tincto; thorace æneo micante, minus remote, ad latera crebrius punctato, punctis oblongis; elytris flavis, sat fortiter punctato-striatis, punctis piceis; striis quarta et septima, quinta et sexta, octava et nona apicibus per paria coeuntibus; interspatiis planis, ad apicem et ad latera vix convexiusculis.

Long.  $\frac{4}{5}$  lin.

*Hab.* Cape York, Australia.

Head clothed with adpressed whitish hairs; eyes moderately distant; clypeus broader than long, its upper margin angulate. Thorax nearly twice as broad as long; sides obliquely converging and slightly rounded from base to apex; basal margin slightly bisinuate on either side, median lobe produced, obtusely angulate; upper surface distinctly punctured, the puncturing rather coarser and more crowded on the sides. Scutellum ovate, its apex acute. Elytra with its basal margin, together with that of the thorax, narrowly edged with nigro-piceous.

*Ditropidus submetallescens.*

*D. breviter ovatus*, valde convexus, piceus, nitidus, supra æneo micans, antennis basi pedibusque (tarsis exceptis) obscure piceo-

fulvis; thorace subremote, tenuiter punctato; elytris sordide fulvis, picco tinctis, aneo vix micantibus, distincte punctato-striatis, punctis piceis; striis quarta et septima, octavaque et nona apicibus per paria coeuntibus, interspatiis planis.

Long.  $\frac{2}{3}$  lin.

*Hab.* Gawler Town, South Australia.

Vertex smooth, nearly glabrous; face between the eyes faintly rugulose, sparingly clothed with adpressed yellowish hairs; clypeus very short, transverse, raised and forming an abruptly elevated ridge; eyes distant; antennæ equal in length to the thorax, the four or five lower joints obscure fulvous, the rest piceous. Thorax more than twice as broad as long; sides slightly converging from the base to beyond the middle, thence obliquely rounded to the apex; basal margin distinctly bisinuate on either side, median lobe produced, nearly rectangular; upper surface distinctly but sub-remotely punctured, the punctures oblong, rather coarser on the disk than on the sides; interspaces shining, impunctate, faintly strigose (when viewed under a strong lens) on the sides and at the base; extreme basal border edged with nigro-piceous. Scutellum ovate, acuminate at base and apex. Elytra obscure flavous with a faint brassy tinge, stained on the disk with piceous, the extreme sutural and basal margins narrowly edged with nigro-piceous; distinctly punctate-striate; interspaces (when seen under a deep lens faintly wrinkled) plane, hinder half of the two outer ones very slightly convex.

Separated from *D. amabilis* by its nearly glabrous vertex, its shorter, elevated clypeus, and also by its broader and more remotely punctured thorax.

*Ditropidus cornutus.*

*D. oblongo-ovatus*, convexus, fulvus, nitidus, antennis extrorsum nigris; thorace subremote punctato, punctis elongatis, hic illic longitudinaliter confluentibus; elytris flavis, fusco maculatis, distincte punctato-striatis, striis quarta et septima, quinta et sexta, octavaque et nona apicibus per paria coeuntibus; interspatiis planis.

*Mas* mandibulis validis, basi cornu compresso valido incurvato, apice acuto armatis.

Long. 1 lin.

*Hab.* Australia.

Head rather deeply but not closely punctured; eyes distant; clypeus transverse, not distinctly separated from the face, its antero-lateral angles in the male each produced outwardly into a stout, compressed, truncate process, which forms the lower



boundary of a deep channel on the cheek, in which lies the basal joint of the antenna; mandibles in the same sex large, curved, and armed on the upper surface at the base with a large, flattened, acute horn, which curves obliquely upwards and inwards on the face of the clypeus; mandibles in the female normal; antennæ rather longer than the thorax, five outer joints black. Thorax twice as broad as long; sides obliquely converging and slightly rounded from the base towards the apex, more quickly rounded near the latter; basal margin distinctly bisinuate on either side, median lobe produced, nearly rectangular; upper surface impressed with oblong or elongate punctures, interspaces here and there longitudinally strigose; disk often stained with rufous, extreme basal margin edged with black. Scutellum ovate, rounded at the base, its apex acuminate. Elytra rather deeply punctate-striate, interspaces plane, very faintly convex near the apex; disk of each elytron more or less stained with fuscous; extreme basal and sutural margins narrowly edged with picaceous.

*Ditropidus subcylindricus.*

*D. subelongatus, subcylindricus, fulvus, nitidus; subtus niger, fulvo variegatus, pedibus fulvis; thorace margine basali, lateribus angustis et disco anticeo, scutello elytrorumque basi, linea laterali, sutura plagaque communi deltoidea, ad basin adfixa, nigris; thorace tenuissime punctato; elytris tenuiter punctato-striatis, punctis elongatis; interspatiis planis, ad latera leviter convexiusculis.*

*Var. A.* Thorace (margine basali excepto) toto fulvo, elytrorum margine basali anguste nigro, sutura picco marginata.

Long.  $1\frac{1}{2}$ – $1\frac{3}{4}$  lin.

*Hab.* Western Australia.

Head clothed with adpressed white hairs; vertex and front minutely punctured, impressed with a fine longitudinal groove, the latter sometimes with a deep fovea; clypeus transverse, rugulose, its upper margin very obtusely angled; eyes widely separated; five outer joints of antennæ thickened, longer than broad, their apices stained with picaceous. Thorax scarcely twice as broad as long; sides obliquely converging from the base to the middle, thence rounded and converging to the apex; basal margin distinctly bisinuate on either side, median lobe moderately produced, obtusely angulate; above subglobose, very faintly punctured; hinder margin narrowly edged with picaceous. Scutellum ovate, its apex acute. Elytra parallel, finely punctate-striate; interspaces plane, faintly and transversely rugulose, those near the outer margin slightly convex.

*Polyachus bicolor*.

*P. oblongo-ovatus*, convexus, niger, nitidus, capite, thorace pedibusque rufo-testaceis, antennis fulvis, extrorsum nigris; thorace remote punctato; elytris sat fortiter punctato-striatis, interspatiis planis, duobus externis convexiusculis.

Long.  $\frac{3}{4}$  lin.

*Hab.* Gawler Town, South Australia.

Vertex smooth, impunctate; clypeus semiovalate, impressed with a few remote punctures; eyes large, subangulate-emarginate, moderately distant, black; antennæ with the six upper joints slightly thickened, the four outer ones black. Thorax about twice as broad as long; sides rounded and converging from base to apex; basal margin slightly bisinuate on either side; median lobe produced, angulate, its apex rounded, entire; upper surface transversely convex; subcylindrical at the apex; apical and basal margins each bordered with a single row of punctures, disk remotely punctured; extreme basal margin narrowly edged with piceous. Scutellum narrowly oblong, its apex obtuse. Elytra strongly punctate-striate; interspaces smooth, impunctate, two outer ones slightly convex.

Very similar in form and coloration to *Bucharis martius*; in addition, however, to the structural difference in the antennæ, it may be at once known by the different form of the basal lobe of the thorax: in *B. martius* it is thickened, its apex being acuminate; in the present insect the lobe is flattened, forming a thin plate, and its apex is rounded.

[To be continued.]

XLIX.—*Note on Lichens.*

By G. H. K. THWAITES, F.R.S.

MY thoughts have been much occupied of late upon the subject of lichens and their development, and especially with reference to the views of Schwendener and Bornet, and of some other botanists who coincide with them in advocating the theory of *parasitism* as explanatory of the structural composition of lichens.

I have not the least desire, nor have I any intention to impugn the correctness of the descriptions and of the beautiful delineations of Mons. Bornet ('*Annales des Sciences Naturelles*,' 4<sup>e</sup> série, tome xvii.); but I must candidly confess that, after prolonged consideration, I cannot bring myself to yield